Add the following new claims

19. A method of manufacturing a dissipative bonding tip comprising:

forming a dissipative material as a bonding tip that has a resistance low enough to prevent a discharge of charge to a device being bonded and high enough to avoid current flow large enough to damage said device being bonded.

20. The method of claim 19 wherein the step of forming includes mixing, molding and sintering reactive powders.

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21. The method of claim 19 wherein the step of forming includes hot pressing reactive powders.

22. The method of claim 19 wherein the step of forming includes fusion casting.

23. The method of claim 19, wherein said dissipative material has a resistance in the range of 10^5 to 10^{12} ohms.

24. The method of claim 19, wherein said dissipative material has a high enough stiffness to resist bending when hot, and has a high enough abrasiveness to function for at least two uses.

25. The method of claim 19, wherein said dissipative material is an extrinsic semiconducting material which has dopant atoms in the appropriate concentration and valence states to produce said resistance.

26. The method of claim 19, wherein said dissipative material comprises a polycrystalline silicon carbide uniformly doped with boron.

27. The method of claim 19, wherein said dissipative material comprises a doped semiconductor, and said step of forming includes forming said doped semiconductor on an insulating core.

28. The method of claim 27, wherein said insulating core is diamond and said doped semiconductor is an outer surface of said diamond that is ion implanted with boron.

29. The method of claim 19, wherein said dissipative material comprises a doped semiconductor, and said step of forming includes forming said doped semiconductor on a conducting core.

30. The method of claim 29, wherein said conductor is cobalt bonded tungsten carbide, and said doped semiconductor is titanium nitride carbide.

31. The method of claim 19 wherein the step of forming comprises:

mixing fine particles of a composition appropriate for forming said dissipative material with a solvent, a dispersant, a binder, and a sintering aid to form a mixture;

molding the mixture into at least one wedge;

drying the at least one wedge;

providing a heat-treating atmosphere that facilitates removal of the binder at a low temperature and that controls the valence of the dopant atoms;

heating the at least one wedge at a temperature appropriate to remove the binder and the dispersant;

heating the at least one wedge to a high enough temperature to sinter the particles together into a solid structure having low porosity; and

cooling the solid structure.

32. The method of claim 19 wherein the step of forming comprises:

forming a solid structure; and

machining the solid structure to achieve a required size and shape within a required tolerance.

33. The method of claim 19 wherein the step of forming comprises:

forming a solid structure; and

treating the solid structure by ion implementation, vapor deposition, chemical vapor deposition, physical deposition, electro-plating deposition, or neutron bombardment to produce a surface layer.

34. The method of claim 33 wherein the step of forming further comprises:

producing the desired layer properties within said surface layer by heating the solid structure in a controlled atmosphere to induce diffusion, recrystalization, dopant activation, or valence changes of metallic ions.

35. The method of claim 19 wherein the step of forming comprises:

mixing fine particles of a composition appropriate for forming said dissipative material with binders and sintering aids into a mixture;

choosing a hot pressing atmosphere to control a valence of dopant atoms;

pressing the mixture in a mold at a temperature high enough to cause consolidation and binding of the particles into a solid structure having low porosity; and

cooling and removing the solid structure from the mold.

36. The method of claim 19 wherein the step of forming comprises:

melting metals of a composition appropriate for forming said dissipative material in a non-reactive crucible;

casting the melted metals into an ingot;

rolling the ingot into a rolled ingot;

extruding the rolled ingot into an extruded material;

drawing the extruded material into a drawn material;

pressing the drawn material in a pressed material; and

heating the pressed material.

37. A method of using a bonding tip, comprising:

providing a bonding tip made with a dissipative material that has a resistance low enough to prevent a discharge of charge to a device being bonded and high enough to avoid current flow large enough to damage said device being bonded;

heating the boding tip using electrical resistive heating; and

using the bonding tip to melt a bonding material.

38. The method of claim 37, wherein said dissipative material has a resistance in the range of 10^5 to 10^{12} ohms.

39. The method of claim 37, wherein said dissipative material has a high enough stiffness to resist bending when hot and has a high enough abrasiveness to function for at least two uses.

40. The method of claim 37, wherein said dissipative material is an extrinsic semiconducting material which has dopant atoms in appropriate concentration and valence states to produce said resistance.

41. The method of claim 37 wherein said dissipative material comprises a polycrystalline silicon carbide uniformly doped with boron.

42. The method of claim 37, wherein said dissipative material comprises a doped semiconductor formed on an insulating core.

43. The method of claim 42, wherein said insulating core is diamond and said doped semiconductor is an outer surface of said diamond that is ion implanted with boron.

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Cont'd

44. The method of claim 37 wherein said dissipative material is a doped semiconductor formed on a conducting core.

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45. The method of claim 44, wherein said conducting core is cobalt bonded tungsten carbide; and said doped semiconductor is titanium nitride carbide.

Add D5

Respectfully Submitted,
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